

6TH WORKSHOP

EXTREMELY PRECISE RADIAL VELOCITIES

EPRV 6

30 JUNE – 03 JULY 2025, PORTO, PORTUGAL

📍 Welcome reception and participants registration:

Sunday - 29th of June - 17:00-19:00

Centro de Astrofísica da Universidade do Porto / Planetário do Porto
Rua das Estrelas
4150-762 Porto

📍 Venue of the conference:

Auditório Ferreira da Silva (auditorium)
FCUP – Departamento de Ciência de Computadores
Rua do Campo Alegre, 1021/1055
4169-007 Porto

📍 Lunch and posters view:

Circulo Universitário do Porto
Rua do Campo Alegre, 877
4150-180 Porto

📍 Public Talk by Michel Mayor:

Tuesday - 1st of July - 18:45

Reitoria da Universidade do Porto
Praça da Gomes Teixeira
4099-002 Porto

📍 Conference dinner:

Wednesday - 2nd of July - 19:00-23:00

Tivoli Kopke Porto Gaia Hotel
Rua Barão de Forrester, 69
4400-034 – V.N. Gaia



MAIN PROGRAMME (Auditorium)

Monday - 30th of June - DAY 1: Instrumentation and its performance

Chairperson: Christian Schwab (9:15-10:00) - Chad Bender (10:30-12:10)

Time	Title	Speaker
8:30	Participants registration	
9:15	Welcome	
9:20	The Keck Planet Finder: commissioning and early science results from two years of operations	<i>Andrew Howard (invited talk)</i>
9:40	NIRPS joining HARPS at the ESO 3.6m: Setting new EPRV standards at near-infrared wavelengths	<i>Francois Bouchy (invited talk)</i>
10:00	Coffee Break	
10:30	ANDES for the ELT: pushing the frontiers of High-Resolution Spectroscopy	<i>Paolo Di Marcantonio (invited talk)</i>
10:50	CHORUS on GTC: Design, Construction, and Science Preparation	<i>Sharon Xuesong Wang</i>
11:05	HARPS3 and the Terra Hunting Experiment	<i>René Tronsgaard</i>
11:20	The Second Earth Initiative Spectrograph (2ES): A next-generation extreme precision spectrograph	<i>Lars A. Buchhave</i>
11:35	Improving radial velocity precision with CARMENES-PLUS An upgrade of the near-infrared spectrograph	<i>Roberto Varas</i>
11:50	A systematic bias in template-matching RV extraction techniques	<i>André Silva</i>
12:05	Lunch Break and Poster View	
13:30	Splinter Session 2 (Room 1) Splinter Session 8 (Room 2)	
15:30	Coffee Break	
16:00	Splinter Session 1 (Room 1) Splinter Session 4 (Room 2)	
18:00	End of Day	



Tuesday - 1st of July - DAY 2: Data reduction & post processing

Chairperson: João Faria (9:00-10:30) - Alejandro Suárez Mascareño (11:00-12:00)

Time	Title	Speaker
9:00	Towards the delivery of iLocater	<i>Marshall Johnson (invited talk)</i>
9:20	Data reduction challenges in optical and infrared pRV	<i>Etienne Artigau (invited talk)</i>
9:50	Combining Solar Data Sets Using Exposure-averaged GPs to Recover Variability and Instrumental Drifts	<i>Jacob Luhn</i>
10:10	10 years of EPRV HARPS-N solar observations	<i>Xavier Dumusque</i>
10:30	Coffee Break	
11:00	New calibration method for BiSON: unlocking 40 years of Sun-as-a-star RV data	<i>Federica Rescigno</i>
11:20	Reaching 40 cm/s RV precision on HARPS-N solar data with a PCA correction at the spectral level	<i>Sara Tavella</i>
11:40	Star or instrument? Probing spectral variability at the pixel level with KPF and NEID solar data	<i>Ryan Rubenzahl</i>
12:00	Lunch Break and Poster View	
13:30	Splinter Session 5 (Room 1) Splinter Session 7 (Room 2)	
15:30	Coffee Break	
16:00	Splinter Session 5 (Room 1) Splinter Session 3 (Room 2)	
18:00	End of Day	
18:45	Public Talk by Michel Mayor	



Wednesday - 2nd of July - DAY 3: Stellar variability and Solar science

Chairperson: Rodrigo Diaz (9:00-10:30) - Heather Cegla (11:00-12:40)

Time	Title	Speaker
9:00	Stellar variability and solar science	<i>Nadege Meunier (invited talk)</i>
9:30	Progress in mitigating stellar variability with NEID Sun-as-a-star observations	<i>Eric Ford</i>
9:50	An RV data challenge to assess the mass characterization of the PLATO RV follow-up: first results.	<i>Michael Cretignier</i>
10:10	Vision Transformers as a Robust Alternative for Identifying Planetary Candidates in Solar EPRV Data	<i>Anoop Gavankar</i>
10:30	Coffee Break	
11:00	Inferring (Super)Granulation Flows Directly and Quickly from Stellar Spectra	<i>Michael Palumbo</i>
11:20	Testing a Universal Activity Indicator with HARPS-N, HARPS and NIRPS Solar Observations	<i>Khaled Al Moulla</i>
11:40	Deciphering the spectral signature of granulation in a quiet K-dwarf	<i>Ancy Anna John</i>
12:00	Unlocking the Detection of Earth-Like Exoplanets by Mitigating Stellar Activity with Deep Learning	<i>Yinan Zhao</i>
12:20	Activity signals in Radial Velocity of active M dwarfs: Revealing two anti-correlated line families	<i>Pierre Larue</i>
12:40	Lunch Break and Poster View	
14:00	Free Afternoon	
19:00	Conference Dinner	



Thursday - 3rd of July - DAY 4: Results/Statistics/Theory

Chairperson: Megan Bedell (9:00-10:30) - Xavier Dumusque (11:00-12:00)

Time	Title	Speaker
9:00	1995-2025 "One, two, three... billions of planets in the Milky Way"	<i>Michel Mayor (invited talk)</i>
9:30	The ESPRESSO follow-up of small transiting exoplanets	<i>Melissa Hobson</i>
9:50	Diving into the planetary system of Proxima with NIRPS	<i>Alejandro Suarez Mascareno</i>
10:10	Seven needles in a haystack: Uncovering the planetary RV signal of the TRAPPIST-1 system with SPIRou	<i>Alexandrine L'Heureux</i>
10:30	Coffee Break	
11:00	Results from the KPF-Obliquities Survey of Small Planets	<i>Luke Handley</i>
11:20	Detailed Architecture of the L 98-59 System and Confirmation of a Fifth Planet in the Habitable Zone	<i>Charles Cadieux</i>
11:40	A star misaligned with its cohort of long-period planets	<i>Salomé Grouffal</i>
12:00	Lunch Break and Poster View	
13:30	Splinter Session 9 (Room 1) Splinter Session 6 (Room 2)	
15:30	Coffee Break	
16:00	Splinter overview	
18:00	End of Day	



SPLINTER SESSIONS

Monday - DAY 1 - 30th of June

13:30 - 15:30 Sessions

Room 1

Session 2: Planets around young stars

Organisers: Louise Dyregaard Nielsen, Oscar Barragan, Matt Battley, Serena Benatti, Ilaria Carleo, Felipe Murgas, Matteo Pinamonti, Alejandro Suarez Mascareño

Time	Title	Speaker
13:30	Welcome and introduction	<i>Louise D. Nielsen</i>
13:35	Refining the Orbit of Young Wide-Orbit companion GQ Lup B using High Precision Radial Velocity and A	<i>Vidya Venkatesan</i>
13:50	Deciphering the Signal of Young Star TOI-942 using Gaussian Processes	<i>Keith Baka</i>
14:05	Navigating the V1298Tau Maze: Revising Planetary Masses and Orbital Architecture of an infant system	<i>Pietro Leonardi</i>
14:20	Consecutive transits of AU Mic b and c observed with PRV as benchmark for mitigating stellar jitter	<i>Zitao Lin</i>
14:35	NIRPS unveils a 17 Myr, Warm, Saturn-massed exoplanet	<i>Leslie Moranta</i>
14:50	Stellar obliquities of gas giant planets	<i>Jiri Zak</i>
15:05	Panel discussion	<i>Members TBD</i>



Room 2

Session 8: A Community Developed EPRV Data Standard

Organisers: Jennifer Burt, EPRV Data Format Team

Time	Title	Speaker
13:30	Introduction and overview of the EPRV Community Data Standard	<i>Jennifer Burt</i>
14:00	EPRV data standard integration with US archives	<i>TBD</i>
14:15	DACE -- An Open Research Platform for Exoplanet Science and EPRV Data Exploration	<i>Damien Ségransan</i>
14:30	The Power of Two - The advantages of two pipelines for NIRPS	<i>Neil Cook</i>
14:45	Community discussion and feedback on the data standard: <ul style="list-style-type: none">• What else should be included?• What use cases should be supported?• How this can be applied to future instruments, etc?	<i>Full group discussion</i>



16:00 - 18:00 Sessions

Room 1

Session 1: Sun-as-a-Star Part I: Accessing and Working with EPRV Solar Datasets

Organisers: Ryan Rubenzahl, Federica Rescigno, Khaled Al Moulla, Lily Zhao, Megan Bedell

Time	Title	Speaker
16:00	Overview of solar feeds	<i>Session organizers</i>
16:10	ABORAS - the polarising Solar Telescope at HARPS3	<i>Annelies Mortier</i>
16:15	The Paranal solar ESPRESSO Telescope: a new step forward to understand stellar noise	<i>Nuno Santos</i>
16:20	Comprehensive survey of sunspots across magnetic field and limb angles	<i>Amy Goodsall</i>
16:30	Solar Activity Dependence of Spectral Lines in EXPRES Data: A Line-by-Line Analysis	<i>Momo Ellwarth</i>
16:40	Tutorial: Using SolAster to calculate component-wise solar RVs	<i>Ben Lakeland</i>
16:55	Tutorial: Downloading from DACE (HARPS-N)	<i>Xavier Dumusque</i>
17:00	Tutorial: Downloading from NEID Solar Archive	<i>Daniel Krolikowski</i>
17:05	Tutorial: Downloading from KOA (SoCal)	<i>Ryan Rubenzahl</i>
17:10	Hands-on: Working with example spectra from each instrument	<i>Session organizers</i>



Room 2

Session 4: Expanding the Role of Photonic Technologies on Extremely Precise Radial Velocities

Organisers: *Francisco J. Pozuelos, Kalaga Madhav, Pedro J. Amado*

Time	Title	Speaker
16:00	Welcome and introduction	<i>Francisco J. Pozuelos</i>
16:10	Astrophotonics for extreme precision radial velocities	<i>Kalaga Madhav</i>
16:30	MARCOT Pathfinder: A New Testbed for Photonic Technologies in High-Resolution Spectroscopy	<i>Marina Centenera</i>
16:45	Fabrication of Photonic Lanterns for High-Precision Spectroscopy	<i>Julius Goehring</i>
17:00	Integrated Photonics in Interferometry: A New Era for Extreme Precision Radial Velocities (EPRV)	<i>Abani Shankar Nayak</i>
17:15	Digital Micromirror Devices for Precision Spatially Resolved Stellar Spectroscopy and Photometry	<i>Christian Robles</i>
17:30	Exploring the limits of precision on a single solar spectral line with a laser heterodyne radiometer	<i>Ryan Terrien</i>
17:45	Discussions and Open Questions	



Tuesday - DAY 2 - 1st of July

13:30 - 15:30 Sessions

Room 1

Session 5A: Gaussian processes and deep learning for stellar activity mitigation

Organisers: João Faria, Manuel Perger

Time	Title	Speaker
13:30	GP intro	
13:40	Ground-truth testing of GP regression with improved stellar models	<i>Belinda Nicholson</i>
13:55	S+LEAF: a fast GP framework to model stellar variability in RV timeseries	<i>Jean-Baptiste Delisle</i>
14:10	Constraining GPs with Entropy Regularization - How to Overcome Overfitting	<i>Leslie Moranta</i>
14:25	Gaussian process periodogram to identify and differentiate activity and planetary signal in RV	<i>Mangesh Daspute</i>
14:40	A statistical model of stellar activity based on physics	<i>Nathan Hara</i>
14:55	A New Imageable Habitable-zone Planet Candidate in the Northern Hemisphere	<i>Paul Robertson</i>
15:10	GP discussion	



Room 2

Session 7: Aiming accurate wavelength calibration

Organisers: Francesco Pepe, Gaspare Lo Curto, Christian Schwab

Time	Title	Speaker
13:30	Summary and conclusion of the Workshop ``Wavelength Calibration for high-resolution spectrographs	<i>François Bouchy</i>
13:42	The Dichroic Calibration Concept - a new calibration scheme for extreme precision radial velocities	<i>Ansgar Reiners</i>
14:04	NAncesor: a satellite for accurate wavelength calibration of ground-based EPRV spectrographs	<i>Maddalena Bugatti</i>
14:21	Exploring solid fused silica metalon as a calibrator for high-resolution optical spectrographs	<i>Supriyo Ghosh</i>
14:38	PSF limitations in accurate wavelength calibration	<i>Maddalena Bugatti</i>
15:00	Discussion	



16:00 - 18:00 Sessions

Room 1

Session 5B: Gaussian processes and deep learning for stellar activity mitigation

Organisers: João Faria, Manuel Perger, Anglada Escude

Time	Title	Speaker
16:00	ML intro	
16:10	Separating Line Shifts from Line Distortions for Radial Velocity Correction using Neural Networks	<i>Jordi Blanco-Pozo</i>
16:25	Reaching the 10 cm/s planetary detection limit on HARPS-N solar data using deep learning	<i>Isidro Gómez Vargas</i>
16:40	Stellar Activity Mitigation: From Sun-as-a-Star Observations to Sun-like Stars	<i>Jinglin Zhao</i>
16:55	Machine Learning Prior for M-Dwarf Spectra in Precision Radial Velocity Measurements	<i>Dhvani Doshi</i>
17:10	TBD	<i>TBD</i>
17:25	ML+GP discussion	



Room 2

Session 3: Sun-as-a-Star Part II: Benchmarking Stellar Variability Mitigation Methods

Organisers: Federica Rescigno, Khaled Al Moulla, Ryan Rubenzahl, Lily Zhao, Megan Bedell

Time	Title	Speaker
16:00	Introduction	<i>Session organizers</i>
16:15	Using Doppler Imaging to model stellar activity and search for planets around Sun-like stars	<i>Baptiste Klein</i>
16:30	Line-by-line shape analysis of NEID solar data	<i>Joseph Salzer</i>
16:45	Measuring Plage Coverage from HARPS-N Solar Spectra	<i>Katlyn Hobbs</i>
17:00	Comparing observed and SOAP4.0-simulated solar RVs: how close are we to accurate modeling?	<i>Alba Barka</i>
17:15	Extreme Stellar Signals Project Introduction	<i>Lily Zhao</i>
17:20	Discussion	<i>Session organizers</i>



Thursday - DAY 4 - 3rd of July

13:30 - 15:30 Sessions

Room 1

Session 9: The RV follow-up of PLATO candidates: will we be able to weigh Earth analogues?

Organisers: Luca Malavolta, PLATO Stellar Variability WG leaders + Top-level WP

Time	Title	Speaker
13:30	Introduction	<i>Luca Malavolta</i>
13:45	The radial velocity follow-up of PLATO transiting candidates	<i>François Bouchy</i>
14:00	The Plato Stellar Variability Working Group	<i>Luca Malavolta</i>
	Towards Earth Analogues	
14:15	Revisiting the CoRoT-7 system in the context of PLATO	<i>Pia Cortes-Zuleta</i>
14:30	The RoPES program for HARPS and HARPS-N: Analysis of the rich multi-planetary system of HD176986	<i>Nicola Nari</i>
14:45	Characterisation of the Earth-sized, temperate planet Gliese 12 b	<i>Yoshi Eschen</i>
15:00	Modeling the vertical velocity gradient to disentangle stellar activity from exoplanet signal	<i>Varghese Reji</i>
15:15	Discussion and concluding remarks	



Room 2

Session 6: Following the flows: observations of stellar supergranulation across spectral types

Organisers: Niamh O'Sullivan, the EPRV RCN Standard Stars Group

Time	Title	Speaker
13:30	Introduction	<i>Niamh O'Sullivan</i>
13:35	The Supergranulation Problem	<i>Niamh O'Sullivan</i>
13:50	The EPRC RCN Standard Star Survey - the data	<i>Arvind Gupta</i>
14:00	The EPRC RCN Standard Star Survey - first results	<i>Jacob Lund/Niamh O'Sullivan</i>
14:10	Discussion Questions: <ul style="list-style-type: none">• What else can we do with the data?• What else do we need?• What should the next standard star observing run look like?• Other supergranulation plans?	
14:55	Discussion feedback and closing remarks	<i>Niamh O'Sullivan</i>